

INDUSTRIAL HYGIENE INFORMATION AND REGULATORY ACTIONS SUMMARY April 2001

REGULATORY ACTIONS

Overturn Ergonomics Standard

On March 20, President Bush signed the Joint Resolution of Disapproval, officially overturning the ergonomics standard. The official citation in the Federal Register is:

[Federal Register: April 23, 2001 (Volume 66, Number 78)], [Page 20403], [Docket No. S-777], RIN 1218-AB36

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Needlestick Rule Now Effective; OSHA Delays Enforcement 90 Days

Changes in the Occupational Safety and Health Administration's bloodborne pathogen standard--designed to protect health care workers exposed to needlesticks--became effective April 18 as originally scheduled, OSHA confirms. The agency also announced it plans a 90-day outreach and education effort before enforcing the revisions.

OSHA ACTIVITIES

President's Budget Has Safety Tone

President Bush has delivered his fiscal year 2002 budget to Congress, spelling out his priorities for several federal agencies' safety programs. The budget requests \$6.6 billion for Department of Labor programs that finance job training and related services, a reduction of \$0.6 billion for 2001. There is no word on how OSHA will be affected by this change. The budget documents stresses "voluntary compliance efforts coupled with continued enforcement." DOL's goal is to increase compliance in nationally targeted industries, including health care, garment production and agriculture, by at least 5 percent.

Chemical Company Safety Director Expected to Be Named OSHA Head

A White House announcement that a safety director for a Missouri chemical company has been selected to head the Occupational Safety and Health Administration is expected soon, sources tell BNA. The anticipated nominee to the post of Assistant

Secretary of Labor for Occupational Safety and Health is John Henshaw, director of environment, safety, and health for St. Louis-based Astaris LLC.

Chao's First Priority is Worker Safety

Labor Department Secretary Elaine L. Chao said that the overall well-being of the nation's workers is her first priority. She also said that the progress that workers and employers are making in reducing workplace injuries and illnesses is encouraging.

"One interesting point in the study [of injuries] is that as more Americans were in the workforce than ever before, the number of ergonomic-related injuries continued to decline, however musculoskeletal injuries accounted for nearly one-third of all the injuries. This finding demonstrates the need for a solid, comprehensive approach to ergonomics. It also points to a need to address injuries before they occur, through prevention and compliance assistance, rather than just rely on reactionary methods," Chao said.

Chao said that she was committed to joining with unions, employers, safety professionals and Congress to develop an effective strategy to reduce injuries. "This is a serious problem, we are addressing it head-on and we intend to find a solution that works." Chao stated that truck drivers, laborers and nurses' aides all suffer especially high injury and illness rates with time away from their jobs. "These workers - together with their employers, families and communities pay a high price for the loss. Together, we must keep finding ways to reduce these rates and improve the safety, health and productivity of these workers."

CONGRESSIONAL ACTIONS OF INTEREST

Senators Grill Labor Secretary, Demand Ergonomics Deadline

Labor Secretary Elaine Chao faced tough questioning by two senators at an ergonomics hearing and repeatedly was asked to name a time line and a deadline for a new ergonomics standard. Chao protested to the Senate Appropriations Subcommittee on Labor, Health and Human Services, and Education that setting a deadline would do no good, but maintained she wants to do what is right for workers.

Democrats Join Unions on Demanding New Ergonomics Standard

Several Congressional Democrats teamed with the AFL-CIO and union groups to call on Chao to immediately develop a new federal ergonomics standard. The group includes Senators Ted Kennedy (Mass.), Hillary Clinton (N.Y.), Tom Harkin (Iowa) and Paul Wellstone (Minn.); and Reps. Nancy Pelosi (Calif.) and Major Owens (N.Y.).

Task Force on Small Businesses

The U.S House of Representatives passed a bill establishing a task force to help small businesses comply with environment, health and safety regulations, as well as other federal agency requirements. The Office of Management and Budget will head the task force. If Congress passes the bill, the task force will compile a report to Congress on federal agency regulations affecting small businesses.

Louisiana Democrat Offers Bipartisan Bill Aimed at Worker Health Improvement

Louisiana Democrat Sen. John Breaux has introduced a stand-alone bill, based on a study completed by the National Academy of Sciences, that would force the Labor Department to adopt a new ergonomics standard within two years. "A safe working environment is very important to Louisiana workers. We must protect the health and safety of millions of Americans workers who often make a living doing strenuous physical labor," Breaux said.

The legislation requires DOL to address

- Work-related musculoskeletal disorders and workplace ergonomics hazards within two years, though it would not apply to disorders that occur outside work or were simply aggravated by work.
- It would point out the circumstances under which an employer is required to take action to address ergonomic hazards, and the measures and compliance obligations required of an employer under the standard.

Additionally the bill would prohibit any overlap with state workers' compensation laws and require OSHA, prior to the ergonomic rule's effective date, to:

- Develop information and training materials
- Implement an outreach program and other initiatives
- Provide compliance assistance to employers and employees concerning the new rule and its requirements.

Members of the Committee on Health, Education, Labor, and Pensions are reviewing the bill.

TECHNICAL ARTICLES OF INTEREST

OSHA Gets Serious About Hearing Loss

The OSHA revised recordkeeping rule, scheduled to take effect January 1, 2002 requires employers to record a change in hearing threshold of just a 10dB average at 2000, 3000, and 4000 Hz.

Various elements are needed to have a successful hearing conservation program (HCP), according to *The Encyclopedia of Occupational Health and Safety*. Included in this checklist are five phases of an effective program:

- Sound exposure surveys of individual, daily noise exposures, including noise maps of the plant showing where hearing protective devices (HPDs) must be worn;
- Engineering and administrative controls used when possible;
- Education and motivation that is updated annually, reinforced with quarterly reminders and backed by management personnel who wear HPD's;
- Hearing protection that is appropriate, is required and its use is consistently enforced in noisy areas;
- Audiometric evaluations that are conducted regularly and employees' auditory history that is updated annually.

The best strategy for making these five phases work together is to unite them under the supervision of one "key individual" who oversees the entire HCP.

Employees' acceptance and use of hearing protection depends on four Cs:

- *Comfort & Convenience*: Employers must make a range of sizes and models available. Letting employees choose their HPDs increases their sense of participation in protecting their hearing, makes it more likely they will take the time and trouble to wear the devices.
- *Communication* - employees want to exchange comments with co-workers, find protection that blocks out noise but does not overprotect.
- *Cost* - letting workers know the cost of not protecting their hearing!

NIOSH FACTS on LATEX ALLERGY

What Is Latex Allergy?

Latex allergy can result from repeated exposures to proteins in natural rubber latex through skin contact or inhalation. Reactions usually begin within minutes of exposure to latex, but they can occur hours later and can produce various symptoms. These include skin rash and inflammation, respiratory irritation, asthma, and in rare cases shock. In some instances, sensitized employees have experienced reactions so severe that they impeded the worker's ability to continue working in their current job.

The amount of exposure needed to sensitize individuals to natural rubber latex is not known, but reductions in exposure to latex proteins have been reported to be associated with decreased sensitization and symptoms. People at increased risk for developing latex allergy include workers with ongoing latex exposure, persons with a tendency to have multiple allergic conditions, and persons with spina bifida. Latex allergy is also associated with allergies to certain foods such as avocados, potatoes, bananas, tomatoes, chestnuts, kiwi fruit, and papaya.

How Large a Problem is Latex Allergy?

Reports of work-related allergic reactions to latex have increased in recent years, especially among employees in the growing health-care industry, where latex gloves are widely used to prevent exposure to infectious agents. At least 7.7 million people are employed in the health-care industry in the U.S. Once sensitized, workers may go on to experience the effects of latex allergy. Studies indicate that 8-12% of health-care workers regularly exposed to latex are sensitized, compared with 1-6% of the general population, although total numbers of exposed workers are not known. In the health-care industry, workers at risk of latex allergy from ongoing latex exposure include physicians, nurses, aides, dentists, dental hygienists, operating room employees, laboratory technicians, and housekeeping personnel.

Workers who use gloves less frequently, such as law enforcement personnel, ambulance attendants, fire fighters, food service employees, painters, gardeners, housekeeping personnel outside the health-care industry, and funeral home employees, also may develop latex allergy. Workers in factories where natural rubber latex products are manufactured or used also may be affected.

Prevention

The National Institute for Occupational Safety and Health (NIOSH) recommends wherever feasible the selection of products and implementation of work practices that reduce the risk of allergic reactions. These recommendations include:

1. Use nonlatex gloves for activities that are not likely to involve contact with infectious materials (food preparation, routine housekeeping, maintenance, etc.).
2. Appropriate barrier protection is necessary when handling infectious materials. If you choose latex gloves, use powder-free gloves with reduced protein content.
3. When wearing latex gloves, do not use oil-based hand creams or lotions unless they have been shown to reduce latex-related problems.
4. Frequently clean work areas contaminated with latex dust (upholstery, carpets, ventilation ducts, and plenums).
5. Frequently change the ventilation filters and vacuum bags used in latex-contaminated areas.
6. Learn to recognize the symptoms of latex allergy: skin rashes; hives; flushing; itching; nasal, eye, or sinus symptoms; asthma; and shock.
7. If you develop symptoms of latex allergy, avoid direct contact with latex gloves and products until you can see a physician experienced in treating latex allergy.

8. If you have latex allergy, consult your physician regarding the following precautions:
 - Avoid contact with latex gloves and products.
 - Avoid areas where you might inhale the powder from latex gloves worn by others.
 - Tell your employers, physicians, nurses, and dentists that you have latex allergy.
 - Wear a medical alert bracelet.
9. Take advantage of latex allergy education and training provided by your employer.

Additional Information

NIOSH has issued an Alert, *Preventing Allergic Reactions to Natural Rubber Latex in the Workplace* (DHHS [NIOSH] Publication No. 97-135), that summarizes the existing data on latex allergy. Copies are available free-of-charge from the NIOSH Publications Office while supplies last: telephone **1-800-35-NIOSH** (1-800-356-4674); fax 513-533-8573. Electronic copies are available at: <http://www.cdc.gov/niosh/latexalt.html>

Bloodborne Pathogens

Recent revisions to OSHA's bloodborne pathogens standard (1910.1030) mandated by the Needlestick Safety and Prevention Act, which took effect April 18 will require employers to select safer needle devices and maintain a log of injuries that result from contaminated sharps.

Companies are required to evaluate whether any of their employees have responsibilities that might lead them to come into contact with blood or other bodily fluids. If there is a risk, the employer has to:

- Develop an exposure plan
- Train affected employees
- Offer various forms of protection through vaccinations, work practices and engineering controls.

Violations of standard 1910.1030 most frequently cited by federal OSHA from Oct. 1 1999, through Feb. 24, 2001:

1. 1910.1030(c) - Failure to develop and maintain a written exposure control plan.
2. 1910.1030(d) - Failure to minimize employee exposure to blood or other potential infectious materials through the use, maintenance, sanitation and disposal of proper personal protective equipment.

3. 1910.1030(f) - Failure to make the hepatitis B vaccine available to employees who have occupational to infectious materials and failure to provide post-exposure evaluations of all employees who have had exposure incidents.
4. 1910.1030(g) - Failure to use proper warning labels and signs to mark any containers used to dispose or transport regulated waste, blood or other potentially infectious material.
5. 1910.1030(h) - Failure to properly document all incidents of employee exposure and failure to keep accurate training records.

NIOSH Fact Sheet Highlights Women's Safety, Health Issues

NIOSH released facts about women in the workforce, among which cancer, musculoskeletal disorders, workplace violence and job stress top the list of concerns. Of the 137 million workers, 46 percent are women, with their share of the labor force expected to rise to 48 percent by 2008.

- NIOSH estimates 180,000 new cases of breast cancer and 12,000 new cases of cervical cancer diagnosed in 2000. NIOSH is studying if workplace exposures to hazardous substances may play a role in the development of these types of cancer.
- Homicide is the leading cause of death for women in the workplace. It accounts for 40 percent of all workplace death among female workers. Female workers also are at risk for nonfatal violence. They were victims in nearly two-thirds of the injuries resulting from workplace assaults.
- 60 percent of employed women cited job stress as their number one problem at work. Stress-related illness levels are nearly twice as high for women as for men. Job conditions contribute to stress, including: heavy workloads, little control over work, role ambiguity and conflict insecurity, poor relationships with coworkers and supervisors and other factors such as sexual harassment and the ability to balance work and family issues.
- Sprains and strains, carpal tunnel syndrome, tendonitis and other musculoskeletal disorders account for more than half of the injuries and illnesses suffered by female workers. NIOSH said that more research is needed to determine the factors that place women at greater risk for musculoskeletal disorders. Research will examine if physical differences in the jobs they hold contribute to this increased risk for women.

The fact sheet, "Women's Safety and Health Issues at Work", with additional details and references are available electronically from NIOSH at:

<http://www.cdc.gov/niosh/01-123.html>

Overexertion Causes Most Workplace Injuries

Overexertion, falls and being struck by an object are the leading causes of workplace accidents, according to the first Liberty Mutual Workplace Safety Index. The 10 leading causes of workplace injuries and illness accounted for 86 percent of the \$38.7 billion in wage replacement and medical payments made by employees in 1998, the last year for which data is available.

Accidents	Costs in Billions of Dollars	Percentage of illness/injuries
Overexertion	9.8	25.57
Falls on same level	4.4	11.26
Bodily reaction	3.6	9.35
Falls to lower levels	3.6	9.33
Being struck by an object	3.4	8.94
Highway accidents	2.1	5.46
Being struck against an object	1.9	4.92
Becoming caught in or compressed by equipment	1.6	4.17
Contact with temperature	0.3	0.92

When indirect costs of workers' compensation claims are added to the \$38.7 billion in direct costs identified by the report, the total economic burden of workplace injuries and illnesses is greater, with estimates ranging between \$125 billion to \$155 billion, according to the Liberty Mutual report.

Chronic Conditions Impact Worker Productivity

Heart disease is the strongest risk factor for reduced work productivity, according to a new report, "The Health Status of the United States Workforce," the first-ever evaluation of worker health on a national level. The report concluded:

- Workers under age 55 who have heart disease are eight times more likely to experience reduced productivity than workers without heart disease. Workers in this age group who have diabetes or arthritis are six and four times more likely, respectively, to report work limitations.
- Absenteeism due to health-related causes could result in at least \$65 billion in lost wages annually.

- The presence in the work force of undiagnosed and uncontrolled chronic conditions greatly increases the risk of serious illness.
- 37 million American workers have high cholesterol
- 18 million workers have high blood pressure
- Workers with arthritis are absent from work three times as often as workers without migraines.
- Eight percent of workers aged 18 to 39 screen positive for major depression, but only 12 percent of these workers are treated with antidepressant medications.

Sampling for Toxic Molds

“Toxic Molds” have become a frequent headline in printed media. Nightly news and evening news magazine shows alike have covered shocking stories of families displaced from their homes with a myriad of health problems. The likely culprit is toxic molds following floods or other moisture-producing conditions.

Although molds such as the infamous *Stachybotrys chartarum* are getting all the press, technically speaking, biological contaminants include:

- Airborne particles, such as bacteria, fungi, and pollen.
- Their byproducts, such as endotoxins and mycotoxins.
- Gases and vapors of biological origin, including microbial volatile organic compounds (MVOCs).

The American Conference of Governmental Industrial Hygienists describes *biological contamination* as aerosols, gases, and vapors of biological origin of a type and concentration likely to cause disease or predispose persons to adverse health effects. This can be the result of high indoor levels of biological materials typically found outdoors, or it can be the growth indoors of biological materials that become airborne and reduce air quality.

Health Effects

Fungi or toxic molds are getting all the notoriety because they are the biological contaminant typically implicated in indoor air complaints. Exposure to molds can lead to a variety of health effects that fall into four general categories: allergy, infection, irritation, and toxicity. Similar to chemical contaminants, the overall health impact will be determined by factors such as the amount and duration of exposure and the susceptibility of the exposed individual. Unique to biological contaminants, however, is the impact of the specific fungal species and the metabolic products produced by that species.

Numerous species of mold produce mycotoxins as secondary metabolic products. Mycotoxin-producing mold species are typically referred to as *toxigenic fungi*. Mycotoxins are extremely toxic chemicals that can produce deleterious effects to many parts of the body. They have been implicated in vascular system disorders, and public health professionals are still debating their role in pulmonary hemorrhage in infants. Aflatoxins, a type of mycotoxin found in the agricultural industry, have been shown to be hepatotoxic and carcinogenic. Mycotoxins also have been implicated in immunosuppression and nervous system disorders such as tremors and dizziness. One news magazine show reported that an exposed individual experienced such memory loss and neurological problems that he could no longer function in his job.

Evaluating Biological Contaminants

Evaluating biological contaminants poses a real challenge to safety and health professionals, for these reasons:

- There are no standard sampling methods.
- Concentration variability is quite high.
- Health effects between exposed individuals can vary greatly.
- There are no standards or guidelines on acceptable exposure limits.

However, health and safety professionals can meet this challenge with a thorough investigation and sound, professional judgment. ACGIH recommends that an investigation of biological contaminants begin with an information-gathering phase. This includes interviews of occupants, a walk-through inspection of the area, and notations of complaint versus non-complaint areas.

Second, a hypothesis should be formulated using the information gathered: What do you think could be causing the health complaints or diagnosed disease?

After formulating a hypothesis, professionals can call upon their health and safety toolbox to test the hypothesis by collecting samples. This data can then be used in conjunction with the interview and walk-through inspection to make the final report and recommendations.

Health and Safety Toolbox for Biological Contaminants

The tools for collecting biological contaminants are based on many of the same principles used for collecting chemical contaminants:

- *Bioaerosols* are frequently collected using samplers based on impaction, filtration, and liquid impingement.
- *Gases and vapors from biological contaminants* are collected by adsorption onto sorbent tubes or collection into canisters.

A unique consideration for biological contaminants is whether the organisms need to remain viable for analysis. Viable cells are able to reproduce or they have metabolic activity. Cells must be viable for specific analysis techniques, such as culturing the sample on growth medium (agar).

It is important to contact a qualified environmental microbiology laboratory before collecting any samples. Visit www.aiha.org for a list of microbiology laboratories that participate in the AIHA EMPAT proficiency-testing program.

Samplers Based on Impaction

Bioaerosol Cascade Impactors are used with a pump at 28.3 L/min for typical sample times of 10 minutes. With this technique, air is drawn through the sampler's inlet, accelerated through high speed jets, and the bioaerosols impact onto growth medium or agar. The agar plates are shipped to a microbiology laboratory for growth and culturing. The National Institute for Occupational Safety and Health (NIOSH) has published air sampling methods for bioaerosols using this technique in the latest supplement to the Fourth Edition of the NIOSH Manual of Analytical Methods (see Methods 0800 and 0801, <http://www.cdc.gov/niosh/nmam/method-2000.html>).

Samplers Based on Filtration

As with chemical contaminants, filtration methods for biological contaminants involve the collection of particles by the passage of air through a porous medium, typically a membrane filter. Polycarbonate, mixed cellulose ester or polyvinyl chloride filters may be used, depending on the application requirement.

Non-sterile filters and cassettes can be used for staining and microscopic analysis of total fungi, while sterile filters and cassettes are required for culturing viable fungi. To enhance the viability of fungi, researchers are studying the usefulness of gelatin filters that overcome desiccation problems evidenced with filtration sampling methods. Filter sampling techniques offer the advantage of size selection when used in combination with particle-size selective samplers such as the IOM or Button Sampler.

Samplers Based on Liquid Impingement

Some professionals prefer collection into liquid media rather than collection onto agar plates. Liquid media allows a more rapid, sophisticated microbial analysis using biochemical and immunoassays. The traditional all-glass liquid impinger used for bioaerosol sampling is the AGI-30. The AGI-30 is used with a sonic flow pump at 12.5 L/min for sample times up to 30 minutes.

Recently, a modified impinger called the BioSampler® was developed by researchers at the University of Cincinnati to enhance collection efficiency while maintaining the benefits of liquid collection. The BioSampler allows sampling up to eight hours when used with highly viscous, non-evaporating liquid media.

Sampling for MVOCs

As a result of their metabolism, some microorganisms produce VOCs that can contaminate indoor air. Like other gases and vapors, MVOCs can be collected onto tubes containing solid sorbents or into stainless steel canisters. The samples are then analyzed by gas chromatography/mass spectrometry (GC/MS).

It is important to find a laboratory that is familiar with MVOC analysis and has a GC/MS system calibrated to the common MVOCs. This is a relatively new area of research and development. The role MVOCs play in health effects will undoubtedly be of interest to health and safety professionals in the years to come.

Interpreting the Data

Because there are no recommended exposure limits, data interpretation involves a comparison of indoor versus outdoor and complaint versus non-complaint areas. Identification of the type of biological contaminants at the genus and species levels and comparison of levels from one location to the other can provide valuable information to investigators.

Some species may be considered indicator organisms because they are indicative of moisture and potential health problems. It is, therefore, critical that a representative number of samples be collected in the outdoor ambient air, near the building air intake, and indoors in complaint and non-complaint areas, for adequate comparisons.

Biological contamination is clearly a high-profile health issue at this time affecting schools, day care centers, public buildings and workplaces. Occupational health and safety professionals are encouraged to share their expertise to help manage this public health concern.

Air-O-Cell Cassettes in IAQ Investigations

The Air-O-Cell™, manufactured by Zefon International, Inc., is a unique air sampling cassette specifically designed for the rapid collection and analysis of a wide range of airborne aerosols including mold spores, pollen, insect parts, skin cell fragments, fibers (e.g. fiberglass, cellulose, clothing fibers, etc.) and inorganic particulate (e.g. ceramic, fly ash, copy toner, etc.). The cassette collects both viable and non-viable fungal spores, providing a much broader overview of potential allergens & contaminants than conventional culture sampling techniques.

The Air-O-Cell™ operates upon the principle of inertial impaction. Particulate laden air is accelerated as it is drawn through the cassette's tapered inlet slit and directed towards a small slide containing the collection media, where the particles become impacted, and the air flow continues out the exit orifice. The adhesive nature of the collection media prevents the collected particulate from blurring or being washed off during the staining process, and eliminates sample loss from vibration during handling

and shipment. Laboratories perform direct microscopic analysis of the imbedded aerosols.

The Air-O-Cell™ can be used with any standard off-the-shelf area-sampling pump capable of drawing 15 LPM open flow. The small compact size makes Air-O-Cell™ suitable for use in confined or restrictive spaces.

Sample Materials

- Air-O-Cell™ Cassette
- Vacuum pump capable of operating at a flow rate of 15 liters per minute
- Rotameter
- Flexible tubing

Sample Procedures

- Adjust the sampling pump to a flow rate of 15 liters per minute.
- Connect the Air-O-Cell™ cassette to the sampling pump with flexible tubing.
- Remove the tape seal covering the inlet and place on the side of the cassette.
- Turn on the sampling pump and sample for 1 to 10 minutes, depending on the anticipated loading.
- Replace the seal to the inlet after sampling.

Recommended Sampling Intervals

- Outdoors on a clean windless day - 10 minutes
- Clean office environment or outdoors with no visible dust - 10 minutes
- Indoors with high personnel activity - 5 minutes
- Indoors with drywall renovation or dust - 1 minutes
- Indoors with visible dust emissions - 0.5 minutes

Quality Control

- Outdoor background samples should always be collected for comparison.
- Rotameter should be calibrated with a primary standard.
- The cassette does not produce significant back pressure, so the cassette does not have to be in-line during calibration.

Air sampling for fungi should be conducted to test your hypotheses regarding indoor environments and potential bioaerosol sources. Many investigators use both Air-O-Cell™ cassette and impaction sampling to assess bioaerosol levels. Sampling should be done indoors and outdoors at suspect and control locations. This method is appropriate for identification and quantification of fungal spores such as *Stachybotrys*.

Results from the Air-O-Cell™ cassette are typically higher than those collected from viable sampling and analytical methods. The results are reported as total, meaning they include both viable and non-viable fungal spores. Unfortunately, this technique does not allow for the differentiation between *Aspergillus* and *Penicillium* spores. Small (~1-3u) spherical fungal spores that cannot be identified and may include *Aspergillus*, *Penicillium*, and *Trichoderma* are grouped together as Amerospores. Additionally it does not allow for cultivation or speciation of spores.

Summary of Analytical Method

For the enumeration and identification of fungal spores, the slide is removed from the cassette and stained using Lacto-fuchsin. The entire deposition trace (100% of the sample) is analyzed at 600X magnification using Kohler Illumination. When a count of 500 of any specific spore or particulate is reached, an estimation of the total count of that particle is calculated based on the fraction of the entire trace analyzed to that point.

Excessive particulate debris can mask the presence of fungal spores, thereby reducing counting accuracies. All slides are graded with the following debris scale for data qualification.

- 0 = No visible trace, no particulates observed.
- 1 = Small amount of debris observed, does not affect enumeration.
- 2 = Limited amount of debris observed, counts may be underestimated.
- 3 = Substantial amount of debris observed, counts underestimated.
- 4 = Severe amount of debris observed, counts significantly underestimated.
- 5 = Counts not available due to excessive debris.

Results are expressed as total count per sample and total count per cubic meter. A percentile rank is provided for all fungi identified from the cassette.

Rapid Quantitative Detection of Legionella by PCR

Legionella bacteria are the causal agents of Legionnaires' disease, Pontiac fever, and related pulmonary illnesses. They continue to surface and cause disease. Although there are 39+ species, all capable of causing disease, over 85 percent of all recorded legionellosis cases have been caused by a single species, *L. pneumophila*. It has been estimated that up to five percent of the pneumonia cases that occur in the United States are actually caused by species of *Legionella*. Yet, less than ten percent of these are correctly diagnosed and reported to the Centers for Disease Control. This high incidence of misdiagnoses has been attributed to failures of physicians to order the analytical test and/or from false negatives that are due to the insensitivity of the test itself.

The culture method remains the "gold standard" for detecting *Legionella* from environmental sources. This technique, unfortunately, requires up to 10 days to complete, precious time that could be used to pinpoint sources of the bacteria and prevent additional exposures. A molecular technique, polymerase chain reaction (PCR), offers a very sensitive method, and one that only requires a few hours to complete.

The PCR method provides an extremely powerful screening tool for very rapidly detecting the bacterium in environmental samples, although it doesn't distinguish between living and dead cells. But unless the environment has been recently altered, such as with a biocide application, moderate to high populations of *Legionella* detected by PCR are usually indicative of an existing or potential future problem. Therefore, the PCR method can rapidly identify potential sources, facilitating disinfection processes and help to prevent further exposures. As this method does not determine viability of the bacteria, the PCR screen must be considered presumptive and requires confirmation via conventional culture techniques.

A proprietary PCR method, modified from the one described by Cloud *et al* in the Journal of Clinical Microbiology in 2000, has been developed in the laboratory to detect pathogenic species of *Legionella*. The system can detect less than 100 cells of any of the six pathogenic species of the pneumophila group (*L. pneumophila*, *L. feeleii*, *L. micdadei*, *Fluoribacter bozemanii* and *F. dumoffii*). This new technique is now quantitative and samples can be run in less than one day.

The Safe Workplaces Guarantee is Still Wishful Thinking

Since the passage of the Occupational Safety and Health Act (OSH Act) in 1970, the U.S. job fatality rate has been cut by 75 percent, the injury rate per 100 full-time workers has fallen 42 percent and nearly 237,000 workers' lives have been saved. Yet the promise of a safe and healthful work environment for every American worker remains unfulfilled.

According to Death On the Job: The Toll of Neglect, a state-by-state profile of worker safety and health in the U.S. released by the AFL-CIO last month, part of the reason so many workers remain at risk is the fact that OSHA's staffing and the portion of the federal budget being allocated to job safety and health protection is unequipped to handle such a monumental task. When compared to other federal agencies, OSHA is rather small in size and lacks the staff and funding necessary to oversee the safety of 109 million workers and 7.6 million workplaces under its jurisdiction. The publication alleges that there are only 2,122 federal and state OSHA inspectors responsible for enforcing the law at nearly 8 million workplaces. Ensuring safe working conditions for all American workers is challenging. In fiscal year (FY) 2000, for example, the 847 federal OSHA inspectors conducted just 36,350 inspections (1,876 more than FY 1999) and the state OSHA plans combined conducted 55,564 inspections (723 fewer than in FY 1999). At its current staffing and inspection levels, it would take federal OSHA 109 years to inspect each workplace under its jurisdiction just once. In six states (Florida,

Louisiana, South Dakota, Iowa, Nebraska and Mississippi), that figure jumps to more than 150 years for federal OSHA to pay a single visit to each workplace.

While inspection frequency is better in states that have OSHA-approved plans, it would still take the state OSHAs 63 years to inspect each worksite under state jurisdiction.

That figure, too, has risen in recent years, as the agency would have been able to conduct a visit once every 60 years in FY 1999, once every 59 years in FY 1998 and once every 57 years in FY 1997. In addition larger federal budget allocations to OSHA, the report calls for an extension in coverage to the 8.39 million workers who fall outside of the act's protection, as well as stiffer penalties for significant violations of the law. Currently, serious violations of the Occupational Safety and Health Act carry an average penalty of \$861 to \$960 for federal OSHA and \$771 for state OSHA plans.

Full text of the AFL-CIO report is available at: <http://www.aflcio.org/safety/infodth.htm>

Foot Protection Program

The OSHA standard for foot protection, [29 CFR 1910.136](#), spells out these general requirements: "The employer shall ensure that each affected employee uses protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards." Yet OSHA's Fact Sheet 92-08, "[Protect Yourself with Personal Protective Equipment](#)," established in 1992 that only one of every four workers who suffered a foot injury was wearing safety shoes or boots at the time.

Foot Protection Checklist

- Does your foot protection program include footwear and working surfaces?
- Does it require the reporting of injuries?
- Are program elements enforced and reviewed on a regular basis?
- Is your foot protection selection based upon a documented hazard assessment ([1910.132\(d\)](#))?
- Is there a documented review of employee-owned or provided footwear?
- Is there a policy stating defective or damaged foot protection must not be used and must be removed from service?
- Is disciplinary action used when employees do not adhere to the policy?
- Is training complete and documented for all employees?
- Are all exposed employees wearing protective footwear when necessary?
- Are all foot protection items maintained according to the manufacturer's recommendations?
- Do employees know how to report damaged footwear when it is provided by the company?

- Are employees instructed on the types of hazards that may cause foot injuries and on preventative measures?
- Is there a reporting procedure in place for footwear evaluation and selection?
- Are scrap, debris, and waste stored safely and removed from the work site properly?
- Are aisles and passageways kept clear from tripping hazards?
- Are wet surfaces covered with non-slip materials?
- Are changes of direction or elevation readily identifiable?
- Are aisles or walkways near moving or operating machinery, welding operations, or similar operations arranged so employees will not be subjected to potential hazards?
- Are step risers on stairs uniform from top to bottom?
- Are steps on stairs and stairways designed or provided with a surface that renders them slip resistant?
- Where the ground or surface is wet underfoot, do employees wear impervious boots, shoes, rubbers, or other appropriate shoes?
- Is waterproof footwear provided, or are dry places provided, for standing during wet processes?

INTERNET NEWS

NIOSH Guidance on Bloodborne Infectious Diseases, HIV/AIDS, Hepatitis B Virus, and Hepatitis C Virus

<http://www.cdc.gov/niosh/bbpgg.html>

Speed Up Your Internet Searches

To decrease your time searching on the world wide web, use the Boolean search. A Boolean search is a method that allows you to specify the ordering, grouping and relationships among the keywords and phrases that your search contains. The chart below contains Boolean search terms (operators) and their functions.

Character or Word	Example	Function
" "	"underground storage tank"	Quotes are used for searches. The search will look for the exact words in the order they are placed between quotes.
AND or &	"underground & aboveground storage tanks"	Search for all hits that contain "underground storage tanks" and "aboveground storage tanks."
OR or	"underground aboveground storage tanks"	Using the symbol will allow a combination search. It will find all hits that contain "underground storage tanks" or "aboveground storage tanks"
Not or ~	"underground ~ aboveground storage tanks"	Search for all hits that contain "underground storage tanks" but not "aboveground storage tanks."
[] Note: this is known as a proximity search.	[underground storage tank]	Using brackets will search for those words individually within 100 characters of each other.
? Note: this is known as a fuzzy-word search	Chl?ro?????	Using a ? allows you to substitute or hold a place for a character in a word. The search engine will find all variations of that word in a document containing the exact number of combined alpha characters and "?" marks. In this example, the words "chloroprene" and "chlorinated" would be found.
* Note: this is known as a wildcard search	Tank*or*chloro*	Using an * within a search will look for the word or series of characters that are placed before or between the asterisks and other words within the context that follow or contain those sets of characters. The search tank* will find "tanks", "tanker" and "tankers," and the search *chloro* would find the word "dichlorobenzene."

INDUSTRIAL HYGIENE PROFESSIONAL NEWS

TLV's

ACGIH Worldwide has announced that it ratified the 2001 TLV's. For a detailed list of the substances and agents acted upon, contact ACGIH, (513) 742-2020; or www.acgih.org:customerservice@acgih.org.

More Voluntary Standards

According to the National Institute of Standards and Technology (NIST), government agencies are increasing their use of voluntary standards. However, their participation in the committee private sector standards reviews is declining. NIST surveyed 14 cabinet level departments and 12 independent agencies for the report. Altogether, the agencies retired 542 government unique requirements and specifications, replacing them with voluntary standards. The total is nearly four times greater than the number of substitutions made in 1998.

AEGLs: A Powerful Tool for Emergency Response

The National Advisory Committee for Acute Exposure Guideline Levels for Hazardous Substances develops AEGLs on an ongoing basis to provide federal, state, and local agencies with information on short-term exposures to hazardous chemicals. AEGLs are expressed as airborne concentrations of substances, above which certain adverse health effects--including death--could take place.

The (AEGLs) committee is comprised of 30 voting members with several other members who serve as liaison for their respective organizations. Committee representation is drawn from various state and federal agencies as well as academia institutes, several organizations in the private sector and international members.

The development of the AEGLs is a multistep process focused initially on scientific review of the available toxicological data for each chemical and a discussion of these data in committee meetings open for public comments and presentations. The AEGL committee considers all pertinent information in its deliberations to reach a consensus for each AEGL. The committee uses a set of guidelines to appraise the quality of the toxicological database derived from the National Academy of Sciences publication, Guidelines for Developing Community Emergency Exposure Levels for Hazardous Substances.

The committee has developed a set of standing operating procedures (SOPs) to further enhance the consistency of the AEGL process. Upon review and acceptance of the SOPs by the National Academy of Sciences, National Research Council, Committee on Toxicology, AEGL Subcommittee, they will be published by the National Academy Press. The committee intends to review these SOPs periodically to ensure that they reflect the current methodology for toxicological risk assessment.

For each selected chemical, the committee establishes 15 AEGL values representing three different health effect categories. There are five time periods in each category: 10 minutes, 30 minutes, one hour, four hours and eight hours. The categories are defined as follows:

- *AEGL-1* is the airborne concentration of a substance at or above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation or certain sub clinical, non-sensory effects. The effects are not disabling, are transient and are reversible upon cessation of exposure.
- *AEGL-2* is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects, or an impaired ability to escape.
- *AEGL-3* is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Although the AEGL values represent threshold level for the public, including sensitive subpopulations, it is recognized that certain individuals, subject to unique or idiosyncratic responses, could experience the effects described at concentrations below the corresponding AEGL level.

Upon selection by at least two-thirds of those committee members present at the meeting, of a set of scientifically defensible values, they are categorized as proposed AEGLs. Proposed AEGL's are not recommended for use in chemical emergency programs, since public comment has not yet been formally received via Federal Register. The AEGLs achieve interim status after the committee, following receipt and review of public comment in the Federal Register, has adopted them.

AEGLs Proposed for 18 Substances

Public comment on proposed acute exposure guideline levels for 18 hazardous chemicals was solicited by the Environmental Protection Agency on May 2 (66 FR 21940). The group of 18 includes: methanol; nerve agents GA, GB, GD, and GF; acrylic acid; allyl alcohol; chloromethyl; methyl ether; toluene; phenol; furan; tetrachloroethylene; tetranitromethane; perchloromethyl; mercaptan; carbon monoxide; boron trichloride; diborane; and nerve agent VX.

After public comments are received, the advisory committee on AEGLs will convene and seek consensus on "interim" AEGL values. These interim values will be available to regulators and will also be under review by a subcommittee of the National Academy of Sciences, according to the notice. After NAS weighs in, final AEGL values will be published, EPA said.

PUBLICATIONS

None

ARMY ITEMS OF INTEREST

DoD Ergonomics Conference

The Department of Defense Ergonomics Working Group and the Uniformed Services University of the Health Sciences present the conference:

Forging Ahead

Preventing Work-Related Musculoskeletal Disorders

5-6 November 2001

Westfield Marriott Hotel, Chantilly, VA

The official conference web site will be on line after 1 June 2001. In the interim, if interested in receiving more information as it becomes available, use the on-line form located at: <http://chppm-www.apgea.army.mil/trng/forms/ergo.htm>.

Any problems with this web site should be directed to Ms. Doris Knapp [DSN 584-8139, (410) 436-8139, or Doris.Knapp@apg.amedd.army.mil]

DOD Industrial Hygiene Forum at the AIHCE

The DoD Industrial Hygiene Forum, sponsored by the DoD Industrial Hygiene Working Group, will be held on Monday, June 4, 2001 from 1:00 to 4:00 PM at the New Orleans Marriott, Salon E.

Potential Respiratory Standards, Guidelines for Emergency Workers on Meeting Agenda

A two-day meeting to discuss potential chemical and biological respiratory protection standards and guidelines for emergency workers was held April 17 at Aberdeen Proving Ground, Md., the National Institute for Occupational Safety and Health announced (66 FR 15876) in the March 21 Federal Register.

NIOSH is developing standards and guidelines in collaboration with the National Institute for Standards and Technology and the U.S. Army Soldier and Biological Chemical Command.

The agencies plan to provide information on the progress of their collaborative efforts and their current understanding of "chemical, biological, and radiological respiratory protection issues including threats or hazards, and the developmental status of chemical and biological standards and guidelines," NIOSH said.

The notice said the agencies have evaluated various information to gain understanding of probable terrorism agents including chemical warfare, biological warfare, and toxic industrial materials. A summary of findings will be presented at the meeting for comment and discussion, according to the notice.

For more information, contact John M Dower, NIOSH 1095 Willowdale Road, Morgantown, W.Va. 26505-2888; (304) 285-5907 or fax: (304) 285-6030, or Wayne Davis, Product Director for Respiratory Protection, Project Manager for Nuclear, Biological and Chemical Defense Systems, SBCCOM, 5183 Blackhawk Road, Aberdeen Proving Ground, Md. 21010-5424, ATTN: AMSSB-PM-RNN-P/Wayne Davis; (401) 436-1776 or fax; (410) 436-4185.

JUST THE FACTS

Mine Safety and Health Administration

President Bush announced that he will nominate Dave D. Lauriski as the new assistant secretary of labor for mine safety and health.

Fall-Safe Program Demonstrates Audits, Inspections Make Sites Safer

An ongoing project to reduce injury rates from falls in construction finds that contractors whose work sites were audited and inspected improved their company's ability to control workplace hazards, said Paul Becker, principal investigator with the Fall-Safe Partnership program at West Virginia University. Participating contractors reported reduced workers' compensation costs while the university quantifies improvements in safety practices as a result of the project funded by NIOSH and the Center to Protect Workers Rights.

Federal Worker Fatalities Fall; Total Injury, Illness Rate Rises in 2000

The total injury and illness rate for federal workers rose slightly in the 2000 fiscal year while the number of federal employees killed on the job fell, OSHA announces. The total injury and illness rate was 3.95 per 100 workers, compared with 3.91 in 1999. That compares with a private sector injury and illness rate of 6.3 in 1999, according to figures released by the [Bureau of Labor Statistics](#).

In 2000, 85 federal workers died while on the job, compared with 95 in fiscal 1999 and 146 in 1998. The total number of injury and illness cases in federal agencies increased to 79,321, compared with 74,591 in 1999.

The lost time injury and illness rate, which reflects more serious injuries requiring time off from work, fell slightly from 1.88 for every 100 workers in 1999 to 1.80 in 2000. The overall lost time injury and illness rate in the private sector was 3.0 in 1999.

Agency Results

- In fiscal 2000, the Department of Defense had the most fatalities, with 26, followed by three federal agencies that each lost 13 workers--the Department of Agriculture, Department of Commerce, and the Census Bureau. Both the Department of the Navy and the Department of Interior had 12 fatalities in the 2000 fiscal year.
- BLS reported that manufacturing continued to have the highest injury and illness rate--9.2 cases per 100 workers--in the private sector, but 10 federal agencies had injury and illness rates that exceeded that level.
- The office of the Architect of the Capitol, which is responsible for maintenance of the Capitol building and grounds, including the Botanic Garden, had a rate of 17.9 cases per 100 workers. The other nine with injury and illness rates in excess of 9.2 cases per 100 workers were:
 - ✓ Food Safety Inspection Service,
 - ✓ Bureau of Indian Affairs,
 - ✓ National Park Service,
 - ✓ Immigration and Naturalization Service,
 - ✓ Mine Safety and Health Administration,
 - ✓ U.S. Customs Service,
 - ✓ Bureau of Engraving and Printing,
 - ✓ U.S. Mint, and
 - ✓ Armed Forces Retirement Home Board.
- The two federal agencies with the highest lost time injury and illness rates, reflecting more serious injuries, were:
 - ✓ the U.S. Mint at 6.9 cases per 100 workers and the Bureau of Engraving and Printing at 6.37 cases per 100 workers. Each agency employs around 2,500 workers.

ADMINISTRATIVE INFORMATION

This document was prepared for the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Directorate of Occupational Health Sciences. The POC at the USACHPPM is Mrs. Sandra Monk; Program Manager; Industrial Hygiene Management Program; DSN: 584-2439; COM: 410. 436.2439; e-mail:

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This document summarizes information and regulatory actions that are relevant for Army Industrial Hygiene Program personnel. We distribute this summary in electronic form only. Please make it available to your staff if they do not have direct access to an electronic copy. A copy is posted on the Army IH Program Home Page (<http://chppm-www.apgea.army.mil/Armyih>). If you would like to be added to the electronic mailing

list or if your e-mail address changes, please contact Tammy Budkey, e-mail: tammy.budkey@apg.amedd.army.mil; or call her at DSN: 584-2439; COM: 410.436.2439; fax: 410.436.8795.

At a minimum; we review the following publications in preparing this summary: [AIHA Journal](#); the [Synergist](#); Today (ACGIH's Newsletter); OSHA Week; the [Federal Register](#); BNA OSHA Reporter; [Applied Occupational and Environmental Hygiene](#); The [Journal of Occupational and Environmental Medicine](#); The [Journal of Environmental Health](#); [Professional Safety](#); Safety and Health, [Occupational Hazards](#); [Occupational Health and Safety](#); and [Industrial Safety and Hygiene News](#). We also gather information from a variety of sources on the Internet using the Army IH Program Home Page as our gateway. (<http://chppm-www.apgea.army.mil/Armyih/>).

If you have questions or comments; please contact Jim Evenden at jevenden@lmi.org; 410.638.2081/2086 (voice) or 2093 (fax).